

## 4.0 ENVIRONMENTAL CONSEQUENCES

Highway improvement projects generally have two types of effects on the environment, direct and indirect. Direct effects are defined as effects that are a direct consequence of construction. Land acquisition for a new alignment and changes in traffic patterns are examples of direct effects resulting from a roadway improvement. Indirect effects are consequences that are not immediately or directly caused by the highway improvement but may be eventually manifested as a result of the project. When indirect effects occur following a project, such as a land use change near the new roadway, the effect was not implicitly caused by the highway project. But to a certain extent, the highway improvement project, in concert with other factors, provided the opportunity for the indirect effect to occur.

For this Tier 1 Draft EIS the methodology to assess direct effects assumed that resources and relocations within the entire limits of the corridor (400-foot (121.9 m) wide for the on-alignment and realignment corridors or 600-foot (182.9 m) wide for the bypass corridors) would be measured. It is important to note that some resources would be completely impacted but that there could be shifts in alignment within the corridor that could result in the avoidance or minimization of impacts to the resources when more detailed engineering is completed in future tier efforts.

Direct effects to the natural and physical environment and effects from other transportation projects are discussed in Section 4.1. The socioeconomic environment is discussed in Section 4.2, and Section 4.3 describes indirect effects to the corridor project.

Environmental consequences are further explored in Section 4.4 through Section 4.10. The potential effects of improvements to the existing transportation system is analyzed in Section 4.4. Necessary permits and required approvals for corridor improvements are described in section 4.5. Sections 4.6 and 4.7 explore irreversible or irretrievable commitments of resources and energy, respectively. Section 4.8 details construction impacts of the build alternatives. In section 4.9, a summary table of total impacts is presented in Table 4.9-1. Section 4.10 discusses Section 4 (f) issues.

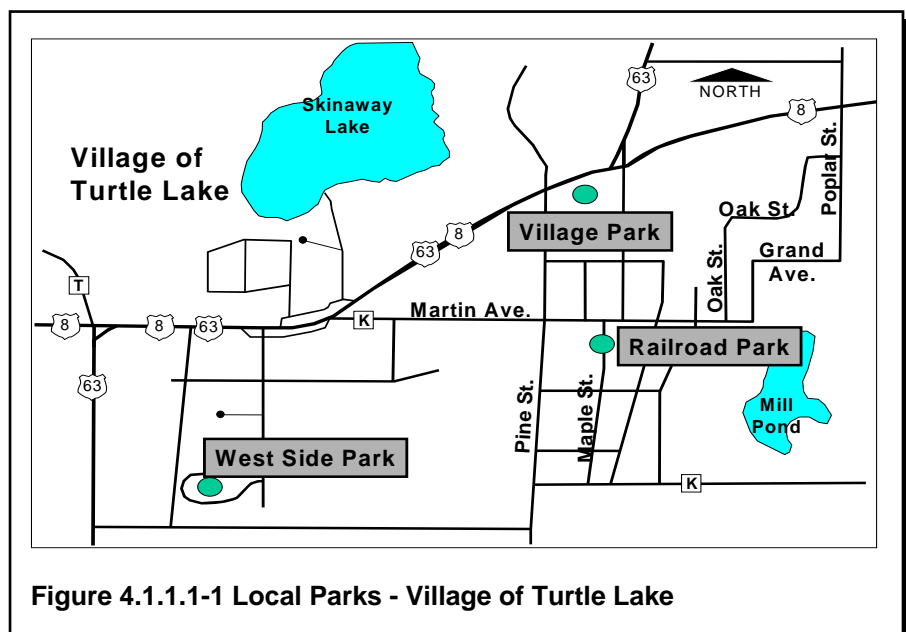
## 4.1 DIRECT EFFECTS TO NATURAL ENVIRONMENT

### 4.1.1 Effects to Specific Corridor Resources

#### 4.1.1.1 Parklands

##### A. Parks and Community Facilities

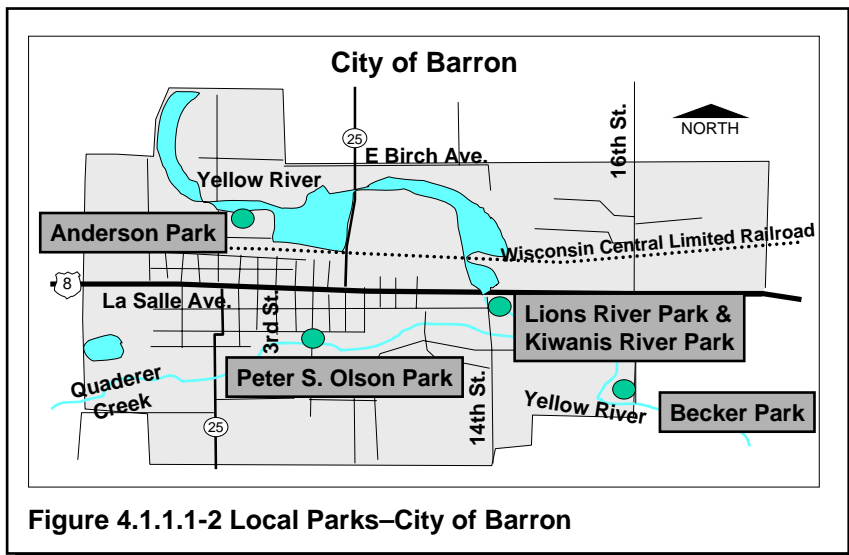
The parklands and recreational facilities near the project were described in Section 3.1.3.1. There are nine community parks in proximity to the US 8 corridor, but the project would not affect them. Figures 4.1.1.1-1 and 4.1.1.1-2 show the locations of the local parks in Turtle Lake and Barron, respectively. The Village of Turtle Lake's West Side Park and Railroad Park are not affected by any of the bypass corridors. The Turtle Lake Village Park is just south of the intersection of US 8 and US 63 (N) and bordered on the east and west by Maple Street and Pine Street, respectively. Village



**Figure 4.1.1.1-1 Local Parks - Village of Turtle Lake**

Park would not be affected by the Turtle Lake Through-town Alternative 4 because there is approximately 130 feet (45 m) of existing right-of-way and no additional land would be required south of existing US 8 and toward the park.

Shadyside Park in Almena is more than 0.25 miles (0.4 km) north of US 8 and would not be impacted. All of Barron's city parks, Anderson, Becker, Lions River Park, Kiwanis River Park, and Peter S. Olson, are located off the project corridor and bypass alternative routes. Becker Park is about 0.25 miles (0.4 m) north of the Barron Bypass Alternatives A and B. Lions River Park and the Kiwanis River Park would not be affected by the Barron Through-town Alternative.



No direct impacts are expected for the Apple River County Park located 0.5 miles (0.8 km) south of US 8 and near the Apple River. In summary, no local, county or state parks would be affected by the project corridor alternatives.

#### B. Hartzell Memorial Field

The Village of Turtle Lake owns the Hartzell Memorial Field located along the north side of US 8 just east of the intersection with US 63 (N). Pedestrians and bicyclists can access the ball field through a 88-ft (26.8 m) long, concrete box culvert that passes under US 8. The Village owns the trail north and south of US 8. Turtle Lake Alternative 4 Through-town would require the box culvert to be extended to fit the expanded roadway. It is anticipated there would be no need for additional right-of-way in this area.

#### C. Cattail Trail

The Cattail Trail is described in Section 3.1.3.1 and Section 4.10 discusses 4(f) impacts. All of the US 8 EIS build alternatives in the Turtle Lake area will impact this multi-use trail owned by WDNR. For each alternative, the intersections of the trail and corridor and associated improvements would be constructed to meet standards. Two of the new crossings would be at-grade, the rest would be grade-separated. The at-grade crossings would be at County KK for Turtle Lake Alternatives 1 and 2. At-grade crossings would be used for the safety of the trail users. The Cattail Trail crossings for each alternative are outlined in Table 4.1.1.1-1. The Cattail Trail crossings are shown on Figure 3.1.3.2-2 and in Appendix C—Local Access Maps.

**Table 4.1.1.1-1**

**Turtle Lake Alternatives and Cattail Trail Crossings**

Cattail Trail Crossing	Turtle Lake Alternative 1 Short South Bypass	Turtle Lake Alternative 2 Long South Bypass	Turtle Lake Alternative 3 North Bypass	Turtle Lake Alternative 4 Through-town
1. West of 63 (S) (Grade-separated)	X	X	--	--
2. On US 63 (S) (Grade-separated)	X	X	--	--
3. County KK (At-grade)	X	X	--	--
4. SE of Mud Lake (Grade-separated)	X	--	--	--
5. Extension of existing box culvert crossing (Grade-separated)	X	--	X	X

X = Trail Crosses Alternative

-- = Not Applicable

For both Alternatives 1 and 2, a crossing is located just south of 125<sup>th</sup> Avenue and just west of US 63 (S). A 185-foot (56.4 m) box culvert would be required for a grade-separated crossing. A second grade-separated crossing would also impact Alternatives 1 and 2 just north of the proposed interchange of US 63 (S) and US 8. A 140-foot (42.7 m) box culvert would be required for this crossing. The realignment of County KK would cross the trail just west of the existing Cattail Trail crossing of County KK. This proposed crossing at the realignment of County KK would be an at-grade crossing for Alternatives 1 and 2. Cattail Trail crosses Alternative 1 again just east of County KK and southeast of Mud Lake. A grade-separated crossing would require a box culvert 185-foot (56.4 m) long.

The final crossing for Alternative 1 and the only crossing for Alternatives 3 and 4 is located on US 8 at the existing box culvert trail crossing just west of 4<sup>th</sup> Street. The expansion of the roadway in this area would involve construction of two additional lanes to the south of the existing roadway. The existing 90-foot (27.4 m) box culvert would be extended approximately 100 feet (30.5 m) to the south. The existing box culvert is perpendicular to existing US 8.

The Cattail Trail is parallel to and just within the corridor limits of Alternative 2 between County KK and 4<sup>th</sup> Street. Because the trail is within the 600-foot (183 m) wide bypass corridor, it is recognized as affected. The wide corridor width would allow flexibility during Actual impacts to the trail from future construction activities in this area would be unlikely and would be avoided if Alternative 2 was selected as part of a preferred corridor.

#### **4.1.1.2 Public Lands and Conservation Organization Land**

##### **A. Overview**

Most of the state and local parks or managed areas listed in Table 3.1.3.2-1 are not located on the project corridor and would therefore not be directly impacted by the proposed alternatives. Public areas and managed lands were taken into consideration during alternative design, and most alignments were designed to avoid impacts to these lands. The Apple River Timber Demonstration Forest, WDNR-owned land, is not impacted by any alternative. The Polk County land enrolled in the County Forest Law Program, just west of the Apple River, was avoided by shifting the corridor alignment slightly to the north. The Lightning Creek Wildlife Area, just west of Almena, was also avoided by a corridor shift to the south. The few that are in close proximity to the project corridor are discussed here and in later sections.

##### **B. Joel Marsh Wildlife Area**

The Joel Marsh Wildlife Area is a large, WDNR-managed wetland area located adjacent to and south of (downstream) US 8. Any construction upstream of the wildlife area, whether on alignment or to the north, would cross the North Branch of Beaver Brook and could affect the downstream environment in the marsh. Realignment of US 8 south of the marsh is not feasible because the size of the marsh would require a very lengthy and costly realignment.

Alignments in the area of the Joel Marsh Wildlife Area were developed with an emphasis on minimizing the effects of the unavoidable impacts of the On-alignment and Northern Realignment Alternatives. For the On-alignment Alternative, the existing traffic lanes are used as the east-bound lanes and two additional lanes would be constructed to the north of the existing lanes, away from the wildlife area. With a Northern Realignment Alternative a new four-lane bridge crossing the North Branch of Beaver Brook, which flows into the marsh, will be needed. Under both scenarios the wildlife area may be affected by construction in the area, but no WDNR land will be acquired. The crossings will attempt to cause both minimal disturbance to the area of the crossing and the downstream environment in the marsh. This may involve selective clearing, maintaining or installing herbaceous or woody buffer strips or other Best Management Practices as directed during the coordination the WDNR. Impacts to Joel Flowage are also discussed in Section 4.10 of this report, Section 4(f) and 6(f) Impacts.

### C. Deer Lake Conservancy Land

Deer Lake Conservancy is a tax exempt, non-profit organization with a mission of preservation of Deer Lake. The Conservancy purchased a 70 acre (28.3 ha) parcel (Flagstad Farm Preserve) just south of existing US 8 and Deer Lake. WDNR funds in the form of a Lakes Protection Grant were used to assist with the land purchase. This parcel will be directly affected by all three Deer Lake Alternatives. The On-Alignment and Southern Realignment Alternatives pass through the entire length of Conservancy land from west to east. The Far Southern Realignment Alternative would directly impact only a small area of the southwest corner of the Conservancy land. The purpose of the Conservancy land is to improve the quality of the water draining from this land. The parcel of land is viewed as critical to the water quality of Deer Lake since it is a direct drainage area to the lake.

### D. Waysides and Public Access

A wayside is located on the northwest corner of the WIS 35 (N) intersection with US 8 (see Figure 4.1.1.1-3). Access would remain until improvements are completed in this segment of US 8, at which time the wayside would likely be removed and the access eliminated.

Two public access boat ramps are located on Upper Turtle Lake, just north of US 8 and public access to the Red Cedar River is also available on County W and south of US 8 on 19th Street. There would be no impact to these public access locations from any alternative.



**Figure 4.1.1.1-3 Wayside off WIS 35 (N)**

### 4.1.1.3 Water Resources, Floodplains, and Wetlands

The US 8 corridor crosses many waterways, wetlands, and floodplains in the St. Croix River and the Lower Chippewa River Basins. The Balsam Branch, Upper Apple River, and Beaver Brook watersheds in the St. Croix River basin are affected. Affected watersheds in the Lower Chippewa River Basin include the Hay River, Yellow River, and the Red Cedar River. Construction activities associated with project alternatives for US 8 may produce the following direct impacts or effects:

#### A. Removal of Shoreland Vegetation Along Stream Banks

Removal of some shoreland vegetation and stabilization with riprap or allowable erosion control materials contained and approved within WisDOT's Product Acceptability List (PAL) would be necessary for new structures through waterways for new roadway alignment or expansion. The removal of this vegetation would alter riparian habitat for aquatic and terrestrial species. The removal of vegetation can also increase the potential for erosion. Native vegetation disturbance could allow for the possible introduction of exotic species.

#### B. Alteration of Water Quality

Sediments in waterways may increase as a result of runoff from construction areas or altered flow paths, which could affect water quality. Other minor effects to water quality may include increased chemical concentrations from increased use of road salts and vehicle contaminants from roadways/runoff.

#### C. Alteration of Stream Hydrology

Stream hydrology could be altered along the corridor by the construction of structures such as bridges and culverts. Structures may affect flood storage capacities and adjacent wetlands. Changes in the flow of an aquatic system can alter the aquatic/terrestrial floodplain relationship that is key to forming

communities of species along waterways or major rivers.<sup>1</sup> New bridges and culverts would be sized to have no effect on the existing backwater elevations in compliance with Wisconsin Administrative Code NR 116 and NR 320.

#### D. Corridor Severance and Impacts to Species

New alignment construction, new structures, or expanded structures may hinder movement of animals like fur-bearers and reptiles along the corridor's waterways. Appropriate sizing and placement can minimize such issues. This may include the expanded use of wildlife crossing and barrier placement as well as widened spans for floodplain crossings to facilitate wildlife movement with a riparian buffer of crossings.

With proper design, the impacts of the project corridor are expected to be localized and minimal, but some ecological effects may be realized. The project corridor alternatives may affect previously disturbed areas where structures currently exist on the mainline, and it may possibly affect undisturbed areas where bypasses are proposed to be constructed. The alteration of bank or shoreline vegetation, alteration of stream hydrology and wetlands, and corridor severance will lead to loss of habitat.

Loss of habitat and water pollution may lead to ecological problems or localized population shifts. Impacts could include loss of native species, populations dominated by disturbance-tolerant species, reduced species richness, loss of links in the food chain, reduced community abundance, and community instability. Plant or animal community changes may occur as the result of direct habitat loss, degradation, or alteration.

Development and human disturbance to natural habitats may fragment existing communities or populations. Large, continuous ecosystems or habitats are fragmented when they are broken up into smaller areas and surrounded by decreased or altered land. Areas of disturbed water quality can also fragment aquatic systems by limiting the presence of less tolerable species. Fragmentation impacts include isolated populations, decreased genetic diversity, and isolation for spawning, nursing, or adult habitat.

#### E. Alteration of Wetland Communities

Road construction and new river, stream, creek, or waterway crossings could fill and affect between 75 to 110 wetlands located along the corridor. Impacts could range from a minimum of approximately 101 acres (40.9 ha) to nearly 192 acres (77.8 ha), depending on the alignment selected and assuming all wetlands that are within the full corridor width would be impacted. The use of 400-foot (121.9 m) and 600-foot (182.9 m) corridor widths reflects the planning nature of this study. During future, detailed design efforts, the direct impact and effects to aquatic systems and wetlands would be avoided, minimized, or otherwise reduced by alignment adjustments and the bridge designs used. Construction of bridges or widened alignments will fill riparian wetlands or isolated wetlands and infringe on navigable waterways. Similarly, altered corridor drainage patterns, could affect wetland characteristics within the watershed based on hydrology or water quality. Interrupted flow patterns may dry wetland areas or may cause conditions to become wetter in some areas. Other than direct impacts of decreasing their area, some wetlands may have reductions in corresponding vegetational diversity and/or the potential for invasion of low-quality native or invasive species.

The approximately 10-14 named waterways, creeks, streams, and rivers are located amidst approximately 6 designated watersheds and sub-watersheds as grouped by the agricultural and natural resource agencies in the corridor. Progressing from west to east the project encompasses a portion of three sub-basins of the St. Croix River Basin. This includes the Balsam Branch, the Upper Apple River, and Beaver Brook Watersheds. Sub-watersheds within the Lower Chippewa Basin to the east include the Hay River, the Yellow River, and Red Cedar River watersheds. In addition to the riparian drainageways and adjoining wetland buffers, within the project area, many isolated wetlands (meadows and woodlands) are present at woodland transition areas and/or adjacent to the roadway in Polk County and around Turtle Lake. The project specific reviews also identified additional unmapped wetlands and farmed wetlands in Barron County.

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<sup>1</sup>WDNR, *Wisconsin's Biodiversity as a Management Issue*, 1995, Pub- RS-915 95.

Most of the WDNR mapped wetlands are associated with rivers, creeks, and other drainageways that intersect the corridor. About 25 percent of the wetlands and/or wetland impacts located on the project alignments and included in the project impact maps were isolated or small wetlands not identified on the Wisconsin Wetland Inventory maps (unmapped). A combination of off- and on-site reviews and field meetings between project staff and WDNR reviewers was used to locate and approximate these additional areas. Field reviews were completed to the extent possible without directly accessing off-alignment subject properties along the 40-mile (64 km) corridor. A general categorical assessment of the wetlands' functional, floristic, or regional importance value was included in the wetland summary table (Table 4.1.1.3-1). A wetland of small size and isolated from a larger wetland complex was given a "Low" rating whereas a wetland associated with or forming a broad, riparian buffer of a stream with various functions (wildlife food, cover, groundwater recharge or discharge or having other contributory value to water quality) was given a "High" functional value rating. Similarly, if wetland or surrounding vegetation was monotypical, such as dense reed canarygrass, or an area was subject to low species diversity from agricultural runoff, then a "Low" floristic value rating was applied. The determination for grouping of wetlands into the Low, Mod, or High regional importance category was generally a combination of the wetlands size, location, functional value, and floristic or other values.

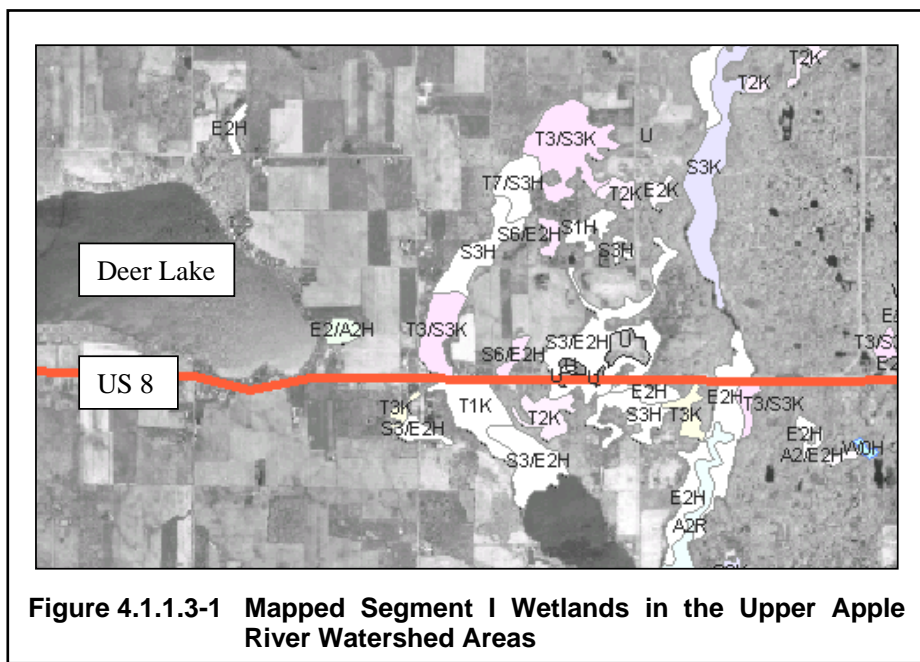
Wetlands representing more advanced ecological development or habitats will require special review and attention during future detailed design efforts. The functions of forested wetlands (wooded swamps, riparian palustrine forests) and other unique wetland types such as fens and high quality riparian wetlands place them in categories of "red-flag" wetlands according to WisDOT and WDNR guidance. The WisDOT wetland mitigation procedures are designed to place additional protection on such areas by requiring increased wetland replacement ratios. Lists of all affected waterways and wetlands for each corridor alignment are summarized in Table 4.1.1.3-1. High quality wetland types or communities described above are represented as or by: (a) the WS/RPF category of wetlands in the table; (2) the extensive forested upland and wetland communities associated with Turtle Lake bypasses; and (3) the more riparian emergent wetland mixes present on bypass areas around Barron. These wetlands and other "red-flag" wetlands should be afforded appropriate attention during final design. Impacted acreage totals indicate the least impacting alignment would include about 101 acres of wetland impacts with approximate percentages of the wetland takings as follows: Aquatic Bed (16 percent), Wooded Swamp/Riparian Forested Wetland (18 percent), Wet Meadow/Riparian Palustrine Emergent (26 percent) and Scrub-Shrub (40 percent). The most impacting alignment could involve as much as 192 acres of wetland impacts. Impacts are estimated to occur in the following proportions: Aquatic Bed (11 percent), Wooded Swamp/Riparian Forested Wetland (15 percent), Wet Meadow/Riparian Palustrine Emergent (40 percent) and Scrub-Shrub (34 percent). It should be noted that project specific delineations and avoidance techniques would be utilized in the design phase for construction of any designated segments. Similarly, the total affected wetlands may be less than the listed totals because the "build" alignment would likely not require the entire 400-foot (121.9 m) and 600-foot (182.9 m) corridor.

Due to the length of the corridor, wetland discussions are summarized in the table provided. General discussions on wetlands related to main watershed groupings and corresponding corridor segments (Segments I to VII) are provided below. Wetland types are described according to the Wisconsin Wetland Inventory nomenclature because the reference or base mapping is in that format. The summary table includes impacts divided into the most representative WisDOT wetland mitigation banksite categories.



### E.1. Balsam Branch and Upper Apple River Watershed and wetlands of Toby Creek/Balsam Branch–Segment I

The mainline section of Segment I crosses the upland watershed of Deer Lake as well as Toby Creek, Balsam Branch, and many wetlands associated with these two waterways. Deer Lake, Toby Creek, and Balsam Branch are all contained in the Balsam Branch Watershed, of the St. Croix Basin. It is listed as a priority watershed. The Toby Creek corridor wetlands include broad-leaved deciduous forested, and broad-leaved deciduous scrub/shrub wetlands. Wetland complexes in the low area between Toby Creek and the Balsam Branch include evergreen and broad-leaved deciduous trees and scrub/shrub, and narrow-leaved persistent emergent/wet meadow. The Balsam Branch wetlands are mostly narrow-leaved persistent emergent/wet meadow. Figure 4.1.1.3-1 illustrates Toby Creek and Balsam Branch Wetlands. Additional isolated wetlands exist east of WIS 46. Most are wooded swamp, forested and scrub-shrub wetlands. The hydrology of most of this area tends to support standing water at or near the ground surface during the spring and fall. Wetland impacts within the cumulative Segment I corridor vary from a minimum of 39.6 acres (16.0 ha) for the Deer Lake Southern Realignment to a maximum of 50.2 acres (20.3 ha) for the Deer Lake Far Southern Realignment. About 75-80 percent of impacts are to woody wetland habitats (shrub and forested).



**Figure 4.1.1.3-1 Mapped Segment I Wetlands in the Upper Apple River Watershed Areas**

### E.2. Apple River Watershed near Brusher/Clover Lakes and Apple River–Segment II

Brusher and Clover lakes are large connected open water habitats in this segment. Brusher Lake is the northern lake and Clover Lake is the southern lake currently crossed with an existing causeway. A dam exists on the Apple River north of US 8 at the intersection with County H near WIS 46 (S). Some substantial recreational uses (canoeing and watersports) occur on this northern portion. This roadway Segment II is planned as an on-alignment improvement. As such, Clover Lake will be impacted and currently consists of a constructed causeway of earthen fill reaching an elongated natural island about midway and equidistant from the original topographic shoreline edges. Additional fill using an earthen lake crossing would involve aquatic bed and marsh impacts of about 5.5 acres (2.2 ha) of wetlands. Future minimization techniques would need to be employed. To illustrate avoidance evaluations, bridging the lake in future years would involve 6 million dollars in construction costs. About 8.4 acres (3.4 ha) of cumulative fill is anticipated for the total segment and consists of additional wet meadow, scrub-shrub, and also riparian palustrine emergent near the Apple River.

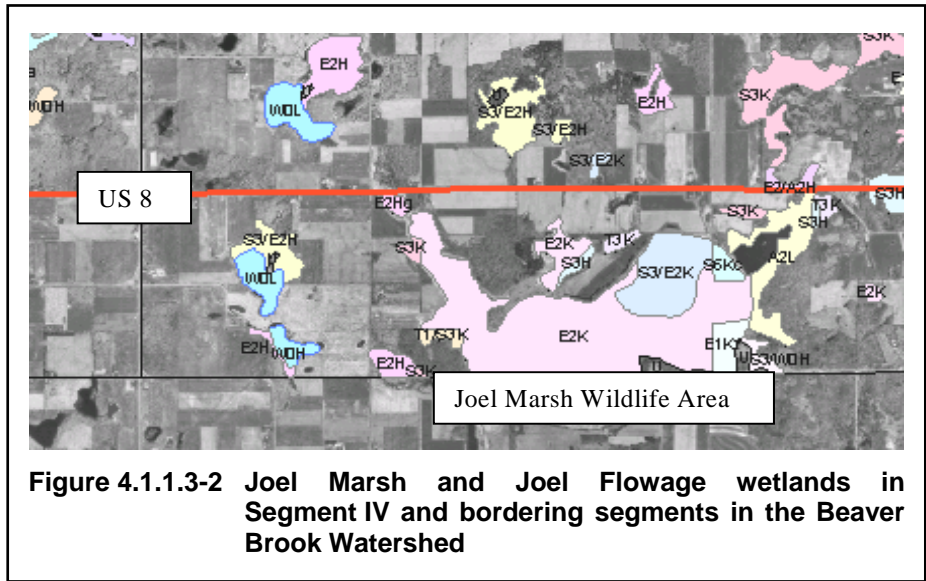
### E.3. Beaver Brook Watershed Wetlands–Segment III

The Beaver Brook Branch is the easternmost sub-basin of the St. Croix River watershed. It covers portions of Segments II, III and IV. Existing wetland resources in Segment III mainly involve aquatic bed and shallow marsh wetland types associated with Twin Lakes as mapped on WDNR mapping. There are other open water/aquatic bed, forested and scrub-shrub wetlands distant to the alternatives under consideration that were unmapped. The Southern Realignment alternative minimizes the wetland impacts on this segment to 4.9 acres (2.0 ha). The On-alignment option is projected to involve 6.7 acres (2.7 ha)

and the Northern Realignment alternative 9.6 acres (3.9 ha). Aquatic bed and shallow marsh would be the predominant impacted wetland types.

#### E.4. North Branch Beaver Brook Watershed, Joel Flowage, Associated Wetlands—Segment IV

Wetlands of the North Branch of the Beaver Brook Watershed include riparian and sedge/wet meadow and forested habitats of the North Branch of Beaver Brook and the Joel Flowage. The impacts would center on the 15 to 30 foot (4.6 to 9.1 m) wide main channel and bordering broad-leaved deciduous scrub/shrub and sedge meadow wetlands. The potential need for acquisition from the WDNR's Joel Marsh Wildlife Area required alignments to be shifted north to avoid impacts to the Wildlife Area. Such alignments will necessarily impact a long stretch of the North Branch paralleling and north of the US 8 roadway. Thus this on-alignment area will require special design considerations to minimize wetland and stream relocation or bypass impacts associated with the navigable waterway. A far north off-alignment area would have fewer wetland impacts through avoidance of the main waterway/channel paralleling US 8, but creates a new crossing, thus requiring a new four-lane bridge with the associated corridor fragmentation and floodplain encroachment. The total wetland impacts in Segment IV could vary between 11.4 acres (4.6 ha) and 15.5 acres (6.3 ha) for the off- and on-alignment alternatives respectively. Figure 4.1.1.3-2 illustrates the Joel Marsh and Joel Flowage WDNR mapped wetlands south of US 8 and the Beaver Brook areas north of US 8.



**Figure 4.1.1.3-2 Joel Marsh and Joel Flowage wetlands in Segment IV and bordering segments in the Beaver Brook Watershed**

#### E.5. Hay River Watershed: North Branch Beaver Brook, Turtle Creek, Turtle Lake, and Associated Wetlands—Segment V

The Hay River sub-watershed begins the western limits of the larger Lower Chippewa River watershed that includes Segments V through VII. The Yellow and Red Cedar sub-watersheds follow in that order. Wetlands described here are mainly scrub-shrub riparian meadows contained in the Hay River Watershed. The North Branch of Beaver Brook stretches into the northwest portion of Segment V and North of Turtle Lake. Much of the adjoining lands are well-wooded uplands forming a beneficial blend of habitats within large contiguous forested blocks. The Turtle Lake Alternative 3 (North Bypass) is currently estimated to have fewer wetland impacts (approximately 30.8 acres (12.5 ha)) as compared with the Short South bypass, but would substantially fragment a large array of upland and lowland habitats and forest interiors. The alignment would include fringe or south bank impacts areas to Beaver Brook and associated wetlands (forested/shrub and herbaceous) north of Turtle Lake but without an apparent direct stream crossing.

Turtle Creek flows from Upper Turtle Lake to Lower Turtle Lake. All alternatives on this alignment use the existing crossing of Turtle Creek. The through town alternative minimizes wetland impacts to about 3.9 acres (1.6 ha), especially as compared to the next lowest alternative (short south bypass) which is estimated to impact 26.7 acres (10.8 ha). The Turtle Lake Alternative 2 (Long South Bypass) would affect a large broad-leaved deciduous scrub/shrub and persistent emergent/wet meadow wetland. The emergent wetland impacts (marsh and riparian meadows) associated with this alternative would total approximately 25 acres (10.1 ha) with cumulative impacts of approximately 43.7 acres (17.7 ha). Individual impacts related to the Segment V alternatives are described in Table 4.1.1.3-1. The through town alternative is



recommended for this segment, thus minimizing impacts by at least 22 acres (8.9 ha) as compared to the other alternatives evaluated.

#### E.6. Hay River Watershed, Lightning Creek and Associated Wetlands—Segment VI

The Hay River Watershed continues to be prominent in this Segment and includes the meandering wet meadow and shrubland wetlands of the Hay River west of Poskin, large portions of the Vermillion River north and northeast of Poskin, and Sweeney Pond Creek South of Poskin. All are warm water fisheries. Lightning Creek will be crossed at its existing locations by all alternatives. It has branches west and east of Alma. Lightning Creek west of Alma is narrow, and relatively straight with a larger area of wetlands bordering the creek north and west of US 8. More agricultural lands are present to the east and south at this location. The Lightning Creek crossing farther east consists of extensive meandering creek(s) among persistent emergent marsh and shrub lands. Much of the adjoining lands are broad wetlands and transitional uplands owned by the Alma Sportsman's Club. The Hay River and Lightning Creek thus form a broad wetland complex south of US 8 east of Alma with the Hay River having a wider and more meandered riparian area. Its wetland types include persistent emergent/wet meadow and shrub. The Hay River Watershed is listed as a priority watershed.

Extensive WDNR mapped wetlands in the area include persistent emergent/wet meadow with some shrubs. WDNR ownership exists northwest of Alma. No off-alignment alternatives were evaluated for the Lightning Creek/Hay River area. The Poskin Southern Realignment avoids the Vermillion River and Sweeney Pond Creek and wetlands distant from the existing alignment. The wetland impacts for cumulative Segment VI alignments are roughly equal regardless of the alternative around Poskin. Impacts totaling about 24 acres (10 ha) with over 80 percent of the impacts to scrub-shrub wetlands and persistent emergent/wet meadow are expected.

#### E.7. Yellow River and Red Cedar Watersheds and Associated Wetlands – Segment VII

Sweeney Pond Creek, Vermillion River, Quaderer Creek, and the Yellow River are all aquatic resources that are part of the Yellow River watershed that extends into this Segment. The Yellow River is dammed and forms a pond near the current US 8 crossing in the City of Barron. The Yellow River is the largest of these waterways and meanders south and east. This segment begins at the narrow, on-alignment roadway crossing of Sweeney Pond Creek and progresses east through Barron and to the Red Cedar River. Impacts are to narrow scrub/shrub and emergent wetlands of Sweeney Pond Creek. The Vermillion River is a receiving water of Sweeney Pond Creek and is present in a relatively agricultural section of Barron County just north of the alignment. The streambank buffers here are narrow and no special designation exists for the waterways.

Quaderer Creek and associated wetlands are moderately well buffered by existing shrub and forested wetland buffers. Although the watershed is mainly agricultural, actively cropped agricultural fields are somewhat distant. Quaderer Creek, as well as the Yellow River would be affected by the Barron Alternatives A and B (Short South and Long South Bypasses) in Segment VII. Alternative A affects approximately 28.4 acres (11.5 ha) with about 50 percent being broad-leaved scrub/shrub and forested and persistent emergent wetlands. Alternative B affects approximately 38.7 acres (15.7 ha) of mainly shrub-scrub/forested and persistent emergent wetlands along Quaderer Creek and the Yellow River. Both of these alignments would involve new waterway crossings.

Alternative C (North Bypass) would cross floodplains and a narrow main channel of the Yellow River. The Yellow River Watershed is a priority watershed. Impacts to Yellow River wetlands and others for Alternative C would total approximately 40 acres (16.3 ha). WDNR wetland types include broad-leaved forested, narrow-leaved persistent and persistent emergent/wet meadow, and free-floating aquatic bed.

Alternative D (Through-town) has the fewest wetland impacts for Segment VII. The largest impact for this alignment would be open water/aquatic bed impacts of about 2.5 acres (1.0 ha) at the Yellow River crossing. The WisDOT recommended alternative in this area has the lowest wetland impacts of any of the off-alignment alternatives.

Only a small portion of Segment VII is in the Red Cedar River sub-watershed of the Lower Chippewa Watershed. A Red Cedar River crossing is a requirement for all alternatives. The area has relatively

steep streambanks, thus some of the projected impacts are from other floodplain or wetland communities in the general area. The Red Cedar River is on Wisconsin's 2004 Proposed 303d list of impaired waters for mercury, phosphorus, and dissolved oxygen. Thousands of acres of agricultural lands make up the majority of this watershed. About 2 acres (0.8 ha) of broad-leaved forested wetlands and emergent meadows or wet grazed lands are affected by the mainline of Segment VII. These totals are included with the cumulative alternative tallies listed above.

#### F. Floodplains

Regulations contained in Executive Order 11988 require roadway improvements traveling across floodplains to be developed in a way that minimizes risk to lives and property from flooding. Roadway improvements must also preserve beneficial characteristics of floodplains. Floodplain maps were reviewed for the project corridor. Federal emergency management agency (FEMA) flood insurance rate maps for Polk County were from 1990 and Barron County flood insurance rate maps ranged from 1988 to 1996.

The project corridor intersects floodplains of Spring Creek, Tobey Creek, Balsam Branch, Apple River, Joel Flowage, North Branch Beaver Brook, Turtle Creek, Lightning Creek, Hay River, Vermilion River, Sweeny Pond Creek, the Yellow River, Quaderer Creek, and the Red Cedar River. Table 4.1.1.3-2 compares floodplain crossings and lateral encroachments for the corridor alternatives. Flood storage loss as a result of this project would be minimal and will follow WisDOT policy. The new structures for corridor alternatives would be sized to allow unrestricted flow during flooding. Backwater elevations would not be raised and the structures would conform to Wisconsin Administrative Codes NR 116 and NR 320.

**Table 4.1.1.3-2**

#### **Affected Corridor Floodplains**

<b>Segment</b>	<b>Option</b>	<b>Floodplain Crossings</b>	<b>Lateral Floodplain Encroachments</b>
I	Deer Lake On-alignment	3	--
	Deer Lake Southern Realignment	3	--
	Deer Lake Far Southern Realignment	3	--
II	Apple River/Clover Lake On-alignment	1	--
III	Range On-alignment	--	--
	Range Northern Realignment	--	--
	Range Southern Realignment	--	--
IV	Joel Flowage On-alignment	1	--
	Joel Flowage Northern Realignment	1	--
V	Turtle Lake Alt 1 (Short South Bypass)	1	--
	Turtle Lake Alt 2 (Long South Bypass)	1	--
	Turtle Lake Alt 3 (North Bypass)	1	1
	Turtle Lake Alt 4 (Through-town)	1	--
VI	Poskin On-alignment	2	1
	Poskin Southern Realignment	2	--
VII	Barron Alt A (Short South Bypass)	4	--
	Barron Alt B (Long South Bypass)	4	--
	Barron Alt C (North Bypass)	4	1
	Barron Alt D (Through-town)	3	--

#### 4.1.1.4 Subsurface/Drinking Water

Polk and Barron County are served by many private and municipal wells that range in depth from about 30 to 200 feet (9 to 60 m) in sand and gravel and as deep as 180 to 750 feet (55 to 230 m) in sandstone formations. Private wells produce in the range of 5 to 100 gallons (18.9 to 379 liters) of water per minute (gpm). The city of Barron's four municipal wells range from 385 to 427 feet (117 and 130 m) deep and produce about 600 to 700 gpm (2,271 to 2,650 liters per minute). The village of Turtle Lake's two wells are 730 and 748 feet (223 and 228 m) deep and produce about 300 to 500 gpm (1,136 to 1,893 liters per minute).

Build alternatives are expected to have a minimal effect on the groundwater in the corridor area. Construction of additional lanes of highway or of new alignments may alter the rate and the location of groundwater recharge. An increase in impervious surface area would result after construction of build alternatives, and rainwater would have to flow off these surfaces before it can infiltrate back into the ground. The total amount of land available for recharge is also slightly reduced as a result of construction. New lanes and roadway alignments could affect drainage patterns that could redirect runoff to different locations for infiltration.

Buildings and homes that would be acquired for right-of-way would need to have wells abandoned, if they are present. This abandonment must be done by a registered well driller in accordance with Wisconsin Administrative Code NR 212.26. When a preferred alternative is selected, wells requiring abandonment would be surveyed.

Proposed US 8 corridor alignments are likely to have minor negative effects to the water quality of the corridor. The WDNR has established three priority watershed projects in the US 8 project area. The Balsam Branch, Hay River, and Yellow River Watersheds were named as priority watersheds because of degraded water quality from mostly agricultural runoff and other factors.

US 8 corridor build alternatives are unlikely to affect nonpoint source pollution levels, but they may introduce small amounts of pollutants from highway runoff or accident-related spills. Roadway maintenance chemicals, such as road salt, may increase in amounts in groundwater recharge because of increased amounts used on the expanded roadway. However, additional salt and other runoff chemicals should not substantially affect groundwater since aquifers are deep and runoff tends to be diluted by precipitation.

#### 4.1.1.5 Wildlife Habitats

The impacts of US 8 corridor alternatives to wildlife in the project area are determined by the impacts to corridor habitat. Habitat is the place where an organism lives and its surrounding environment. Habitat includes everything necessary for an organism's survival like food, cover, and water. The structure of a habitat is defined by slope, height, density, and diversity of vegetation; ground terrain features; and food sources. Structure is organized into both vertical and horizontal components. Ecosystem quality and stability are directly reflected in the abundance or diversity of habitat.

Terrestrial habitats experience some of the same effects from altered habitat as described in Section 4.1.1.3, which described effects to altered aquatic habitats. Construction of US 8 alternatives may alter existing habitat in the study corridor and some of these detrimental habitat consequences are described below.

##### A. Fragmentation

The project area is located within the Forest Transition Zone of Northern Wisconsin. Extensive logging and clearing of forests began when settlers came to Wisconsin in the early 1800s. Expansive northern forests and other natural habitats have been changed dramatically from their original state in terms of continuity, species composition, and size. Many remaining habitats are fragmented by farming, development, or local communities and they continue to be further fragmented by new roadways and other development. Some species benefit from fragmented habitat types, like the white-tailed deer. However, many species may experience negative effects

because of this change. Fragmentation, defined in Section 4.1.1.3, creates three types of changes to habitats: size effects, edge effects, and isolation.

As fragments are reduced in size, the number of species the fragment can support is directly reduced. Many species require a minimum habitat size to survive; therefore as habitat declines, many species follow. As habitat is reduced in size because of development or alteration of land, the edge areas increase. Edge effects may be beneficial for species since they may take advantage of two different habitats. Some species may experience negative effects from too much edge, such as increased competition, predation, and parasitism. As habitat areas become smaller and smaller, it may become all edge. These edge areas may also serve as an entryway for some exotic species to invade. Fragmentation may also lead to isolation of habitat patches. Immobile species or species that cannot travel long distances can lead to loss of genetic diversity of those communities of species, and loss of genetic diversity leads to decreased stability of the species. Efforts to species isolation and fragmentation have been a component of this project. Coordination with agency resource staff to date has not identified vulnerable populations that might suffer from fragmentation.

#### B. Simplification

Simplification, an ecological term, is the result of habitat loss, habitat alteration, pollution, and other factors. Simplification affects an ecosystem's composition, structure, and function. Composition may realize effects such as reduced genetic diversity, reduced numbers of species, or isolated species. Once an ecosystem's structure has been simplified, for example by removing a layer of vegetation, habitats are reduced and the simplified habitat structure cannot support the previous number of organisms that composed the ecosystem. Function refers to the ecological processes (like nutrient, water, carbon, and mineral cycling). When functional losses or interruptions occur in an ecosystem, communities of species would be affected, either temporarily or permanently.

#### C. Corridor Habitats

Wildlife habitat areas along the US 8 corridor can be placed in the following categories:

##### 1. Aquatic and Wetland Habitats

Aquatic and wetland habitats are abundant along the project study corridor. They include waterways and accompanying riparian features as well as isolated wetlands. These areas provide a variety of habitats that support many species. Habitats range from tamarack bog, deciduous tree/shrub forested wetlands, and all manner of intermediate types including wetland meadows. The effects of the project alternatives on this habitat are discussed in Section 4.1.1.3.

##### 2. Woodland Openings

Woodland openings provide habitat for species that are suited to woodland edges and grasslands and benefit from the two types of habitats. The continuity of a forest and open field provides more food and cover than a single habitat type alone. The US 8 off-alignment alternatives, the Deer Lake and Range realignments, and the Turtle Lake and Barron bypasses would affect woodland opening habitats. The on-alignment alternatives would increase some edge effects where right-of-way already meets woodland habitat.

##### 3. Upland Forests

Upland forests in the corridor area would experience edge effects and fragmentation in some project segments because of construction of alternatives. Upland forest areas would be severed by the Turtle Lake Alternative 3 (North Bypass), the Barron Alternative A (Short South Bypass), the Range Northern Realignment Bypass, and the Deer Lake Southern and Far Southern Realignments. The direct impact of construction to the forested areas would be removal and clearing of vegetation. It is noted that some upland forests or woods directly border or transition from wetlands, especially at steep ridges near stream terraces. The affected upland forest areas are described in Table 4.1.1.5-1.

Table 4.1.1.5-1

## Forested Land Impacts

Segment	Alternative	Affected Forested Land (acres)	Affected Forested Land (hectares)
I	Deer Lake On-alignment	24.8	10.0
	Deer Lake Southern Realignment	45.4	18.4
	Deer Lake Far Southern Realignment	63.1	25.5
II	Apple River/Clover Lake On-alignment	15.8	6.4
III	Range On-Alignment	7.8	3.1
	Range Northern Realignment	48.9	19.8
	Range Southern Realignment	14.6	5.9
IV	Joel Flowage On-alignment	7.5	3.0
	Joel Flowage Northern Realignment	13.0	5.2
V	Turtle Lake Alt 1 (Short South Bypass)	10.3	4.2
	Turtle Lake Alt 2 (Long South Bypass)	44.6	18.0
	Turtle Lake Alt 3 (North Bypass)	53.8	21.8
	Turtle Lake Alt 4 (Through-town)	1.1	0.5
VI	Poskin On-alignment	29.5	12.0
	Poskin Southern Realignment	27.7	11.2
VII	Barron Alt A (Short South Bypass)	69.1	28.0
	Barron Alt B (Long South Bypass)	58.5	23.7
	Barron Alt C (North Bypass)	37.7	15.3
	Barron Alt D (Through-town)	10.4	4.2
Total Impacts (maximum)		293.2	118.5
Total Impacts (minimum)		95.1	38.4
Total Impacts (WisDOT recommended alternatives)		140.2	56.7

## 4. Grassy Openings

Grassland habitat is very sparse in the corridor project area. Most of the nonforested uplands are managed as agricultural land. Native grassland habitat is present in the Town of Clinton on the County T Flowage, which is WDNR managed land. This 287-acre (116 ha) parcel of public land is about one mile north of the study corridor and is not impacted. Efforts at the Joel Marsh Wildlife Area have included attempts to create dense nesting fields for waterfowl nesting. This and individual farmer involvement with various government conservation programs may have contributed minor additional acreage of native or introduced grasslands in the project corridor.

US 8 project effects to corridor habitat are described in Table 4.1.1.5-2.



**Table 4.1.1.5-2  
Habitat Effects**

Segment	Alternative	Effects					
		Number of Existing Waterway Crossings Expanded	Number of New Waterway Crossings	Number of Wetland Impact Areas	Number of Woodland Openings Altered	Number of Forested Areas Affected (Includes edge takings)	Number of Forested Areas Severed
I	Deer Lake On-alignment	2	1	38	3	4	0
	Deer Lake Southern Realignment	2	1	39	3	4	2
	Deer Lake Far Southern Realignment	2	1	40	3	4	2
II	Apple River/Clover Lake On-alignment	2	0	5	1	2	0
III	Range Existing Alignment	1	0	8	0	1	0
	Range Northern Realignment	1	1	3	1	2	1
	Range Southern Realignment	0	1	5	0	2	0
IV	Joel Flowage On-alignment	1	0	4	1	1	0
	Joel Flowage Northern Realignment	0	1	8	1	2	2
V	Turtle Lake Alt 1 (Short South Bypass)	0	3	17	1	1	0
	Turtle Lake Alt 2 (Long South Bypass)	0	3	17	1	2	0
	Turtle Lake Alt 3 (North Bypass)	0	1	15	2	1	2
	Turtle Lake Alt 4 (Through-town)	0	1	3	0	1	0
VI	Poskin On-alignment	2	0	14	0	4 (small)	0
	Poskin Southern Realignment	2	0	14	0	4 (small)	0
VII	Barron Alt A (Short South Bypass)	2	2	18	0	5	1
	Barron Alt B (Long South Bypass)	2	2	14	0	5	0
	Barron Alt C (North Bypass)	2	1	18	0	3	0
	Barron Alt D (Through Town)	3	0	10	0	3	0

Segment	Alternative	Effects					
	Total (Maximum)	11	8	110	8	21	6
	Total (Minimum)	9	2	77	5	20	1
	Total (WisDOT recommended alternatives)	9	5	89	5	16	3

#### 4.1.1.6 Threatened and Endangered Species

Potential presence or absence of threatened and endangered species in the corridor was determined through project coordination and on-line reviews of on-line information from the U.S. Fish and Wildlife Service and the WDNR. Current USFWS listings of threatened (T) and endangered (E) species for Barron County include the threatened Bald Eagle (*Haliaeetus leucocephalus*), and the endangered Grey Wolf (*Canis lupus*) and Karner blue butterfly (*Lyceides Melissa samuelis*). Polk County listings include Bald Eagle (T), Grey Wolf (E), Karner blue butterfly (E), and three endangered freshwater mussels that are reported beyond the project limits in the St. Croix River. These species include the Winged Mapleleaf (*Quadrula fragosa*), Higgins eye pearly mussel (*Lampsilis higginsii*), and Spectaclecase. (*Cumberlandia monodonta*). Both the bald eagle and grey wolf have stable populations and are candidates for federal delisting in Wisconsin. Similarly, the Karner blue butterfly has an extensive range in Wisconsin. Special arrangements have been established regarding incidental take permits for this species in Wisconsin. The presence and/or assessment of threatened and endangered mussel species in various waterways will likely be refined during coordination efforts with state and federal experts whenever future design phases occur.

Information from the Natural Heritage Inventory data files and historical data provided by the WDNR-Bureau of Endangered Resources (WDNR-BER) was used to assess impacts to state listed species. Many of the listed species are aquatic, likely because of the quality and abundance of wetland and riverine habitat in the corridor area. BER has recommended that any future construction activities use "time of year" construction restrictions during the spawning period of fish, other aquatic dependant species, and aquatic insect species. Various other techniques may be necessary to avoid impacts to such species. Sediment and erosion control during construction would serve to minimize impacts to aquatic species.

BER has suggested it is reasonable to assume that wood turtles and possibly Blanding's Turtles are present in the corridor. Measures should be taken to prevent such impacts in the project area. If construction starts in the spring, the disturbed areas along waterways should be properly protected with trenched-in silt fence prior to March 15 for riparian areas, and May 1 for nonriparian areas. If silt fence cannot be installed before March 15 or May 1, one method for preventing impacts to turtles potentially found in the area would be to install the silt fence prior to construction and relocate any turtles to habitat outside the fenced area. All corridor segments that cross riverine habitat would be affected, and this includes all project segments and their alternatives except for Segment III.

BER also suggested that a number of species or habitat review surveys be conducted to assess the quality of habitats and/or likelihood for encountering threatened and endangered species listed in Table 4.1.1.6-1. BER will require a survey prior to any future development. WisDOT could contract with a consultant to complete such surveys or BER would provide additional information or investigation for some of the species once design of a defined project area is initiated.

Table 4.1.1.6-1

## Threatened and Endangered Species Impacts

Affected Species	Survey	Listing	Alternative
Assiniboine Sedge ( <i>Carex assiniboinensis</i> )	Survey may be Required	State Special Concern Plant	Barron Alternative C (North Bypass)
Greater Redhorse ( <i>Moxostoma valenciennesi</i> )	Assumed Present	State Threatened Fish	Mainline, Segment VII (Red Cedar River)
Elktoe ( <i>Alasmidonta marginata</i> )	Survey Required	State Special Concern Mussel	Mainline, Segment VII (Red Cedar River)
Round Pigtoe ( <i>Pleurobema sintoxia</i> )	Survey Required	State Special Concern Mussel	Mainline, Segment VII (Red Cedar River)
Pygmy Snaketail ( <i>Ophiogomphus howei</i> )	Survey Required	Federal Species of Concern and State Threatened Mussel	Mainline, Segment VII (Red Cedar River)
Green-faced Clubtail ( <i>Gomphus viridifrons</i> )	Assumed Present	State Special Concern Fish	Mainline, Segment VII (Red Cedar River)
Skillet Clubtail ( <i>Gomphus ventricosus</i> )	Assumed Present	State Special Concern Fish	Mainline, Segment VII (Red Cedar River)
Ozark Minnow ( <i>Notropis nubilus</i> )	Assumed Present	State Threatened Fish	Segment VII, (Vermillion River)
Redfin Shiner ( <i>Lythrurus umbratilits</i> )	Assumed Present	State Threatened Fish	Segment VII (Yellow and Vermillion Rivers, Barron Flowage)
Weed Shiner ( <i>Notropis texanus</i> )	Assumed Present	State Special Concern Fish	Segment VII (Yellow and Vermillion Rivers, Barron Flowage)
Trumpeter Swan ( <i>Cygnus buccinator</i> )	Use BER Specific or General Guidance	State Endangered Bird	Mainline, Segment IV (Joel Marsh/Flowage)
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	BER General Guidance	Federal Threatened Bird	Corridor wide
Osprey ( <i>Pandion haliaetus</i> )	BER General Guidance	State Endangered Bird	Corridor wide
Large-flowered ground-cherry ( <i>Leucophysalis grandiflora</i> )	Survey may be Required	State Special Concern Plant	Segment VII, Barron Alternatives

## 4.1.1.7 Soils

Mapping from Polk and Barron County Soil Surveys, published by the United State Natural Resource Conservation Service (NRCS), was used to identify soils in the project corridor. Section 3.1.3.7 generally describes corridor soil associations. Approximate percentages of soil types were quantified for the seven segments along the study corridor. Table 4.1.1.7-1 describes the soils and productivity for each alternative in the project segments. Rosholt loam and Antigo silt loam, and Anigon silt loam constitute a large part of the percentage of the soil types present along the corridor. Various silt loams, sandy loams, and muck make up the remainder of the soils. The highest yielding prime farmland soils present along the project corridor are Almena silt loam (Ah), Anigon silt loam (AnA and AnB), and Spencer silt loam (SrB). Almena silt loam is present at about 2 to 5 percent in Turtle Lake Alternative 1, Poskin Southern Realignment, and Barron Alternative A. Anigon silt loam is present in Turtle Lake Alternatives 1, 2, and 4, both Poskin alternatives and Barron Alternatives C and D. Anigon silt loam is present in Barron Alternative C at approximately 80 percent and in Alternative D at approximately 20 percent. Spencer silt loam is present on about 5 to 10 percent of Segment IV alternatives, Segment VI alternatives, and Barron Alternatives A and B in Segment VII. The No-build Alternative does not involve additional acreage effects of the described soil types because no right-of-way would be acquired.

Four of the major soil types in the study area are listed as prime farmland. Antigo silt loam (AtA and AtB) is present as approximately 30 to 40 percent of the soil in Segment I in all the Deer Lake alternatives in Segment I. Freenon silt loam (FnB) is present at about 20 to 35 percent in both alternatives in Segment VI. Anigon silt loam (AnA, and AnB) is present mostly north of Barron affecting Barron Alternative C in Segment VII. Rosholt loam (RoA and RoB) is present at a 40 to 60 percent level in all of the Range alternatives in Segment III, however, that is a relatively short segment. Although present in a lesser percentage, the soil type covers a larger area within the north and south of alternatives of Barron in Segment VII.

Coordination with the USDA NRCS offices in Polk and Barron counties did not identify special efforts to protect specific soil regions or types within the study area. Once a WisDOT preferred alternative is selected, Wisconsin Department of Agriculture Trade and Consumer Protection (DATCP) may provide an agricultural impact statement.

#### 4.1.1.8 Agriculture

Agriculture plays an important part in both Polk and Barron County because much of the land is used for agricultural activities. Agricultural land would be affected by all proposed alternatives except for the No-build Alternative.

Agricultural productivity in the project corridor is generally high. Of all soil types in Barron County, 68 percent are considered prime agricultural soils. In Polk County, 56 percent of soils are prime agricultural soils. The predominant soil type affected in Polk County is Antigo silt loam (AtA), with Crystal Lake silt loam (CuB) and Rosholt loam (RoB) having the next largest impact. In Barron County, Anigon silt loam (AnA) is the predominant soil type affected.

There are several types of direct impacts that US 8 proposed improvements may have to agricultural land on the corridor. Effects that are associated with the alternatives under consideration include:

- Loss of farmland and cropland
- Severance of farm parcels
- Landlocked acreage
- Loss of farm buildings
- Disruption of fencing and cattle yards
- Change in farm access or driveway location
- Improved roadway access and travel for farm machinery
- Improved access to markets for agricultural goods and products

Table 4.1.1.8-1 presents quantitative effects of the project alternatives. The following paragraphs discuss each alternative's effect on agricultural lands within the project corridor.

This project is focused on corridor preservation and construction may not occur for several decades; therefore, it is possible that some of the agricultural land that is being impacted today will not be agricultural land at the time of construction. Agricultural land near incorporated communities is most likely to be converted earlier than the construction date.

##### A. Agricultural Land Acquired

The loss of farmland generally has adverse effects to farm operations. Reductions in farmland acreage often reduces crop production and can reduce dairy herd size if compatible replacement land cannot be found. The size and functional capacity of farm investments such as buildings and machinery may not be fully utilized with reductions in farm acreage. A certain size tractor, for example, would be purchased to service a given number of acres. When farm acreage is reduced, the per-unit cost of these investments may increase because they can no longer be used to their maximum capacity.

Farmland acquisition for the alternatives under consideration ranges from less than 0.25 acres (0.10 ha) to over 60 acres (24.3 ha) and includes hobby farms, family farms, and corporate farmland owners (Table 4.1.1.8-1).

All agricultural land acquisitions are subject to Section 32 of Wisconsin Statutes and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended. These regulations require that property owners be paid fair market value for their land and be provided with detail-specific acquisition procedures to ensure fair treatment of landowners.

#### B. Farm Severance

A farm is severed when a road improvement separates farmland into two, noncontiguous parts. Access is maintained to both parcels but sometimes that access requires additional travel. This additional travel can range from a few hundred feet (meters) to several miles (kilometers). If the travel distance between parcels becomes too great, continued farming of the parcels may become time and/or cost prohibitive.

Farm severances can also create small and irregularly shaped fields, which can make equipment usage awkward and production more costly. The increased cost is, in part, due to the additional time, fuel, and equipment wear associated with moving and turning equipment in small fields and irregularly shaped fields. If the fields are severed diagonally, it may be impractical for farm machinery to be maneuvered in the narrow corners of a triangular field. The nonproductive time and labor costs associated with frequent working of these fields may reduce profitability on these parcels. For this project, efforts have been made to minimize irregularly shaped farm fields with the alignments under study.

Sometimes roadway severances create remnants. Remnants are parcels with a shape and size that severely diminish their efficient and productive use. Some remnants may be considered “uneconomic remnants” by WisDOT. Section 32.05, Wisconsin Statutes states:

“...uneconomic remnant means the property remaining after a partial taking of property, is of such size, shape or condition as to be of little value or of substantially impaired economic viability. If the acquisition of only part of a property would leave its owner with an uneconomic remnant, the condemner shall offer to acquire the remnant concurrently and may acquire it by purchase or by condemnation if the owner consents.”

The determination as to whether a remnant is an “uneconomic remnant” is a WisDOT judgment. Section 84.09 of the Wisconsin Statutes states:

“...The department may purchase...remnants of tracts or parcels of land at the time or after it has acquired portions of such tracts or parcels by purchase or condemnation for transportation purposes where in the judgment of the department such action would assist in making whole the landowner, a part of whose land has been taken for transportation purposes and would serve to minimize the overall cost of such taking by the public.”

The landowner must consent to the acquisition of an uneconomic remnant in order for WisDOT to acquire the parcel. The acquisition can be made as a part of the purchase or condemnation of the property.

Alternatives that travel off existing alignment for large distances create more farm severances than those that follow the existing alignment more closely. See Table 4.1.1.8-1 for the farmland severances associated with each alternative.

#### C. Landlocked Acreage

When a road improvement severs a parcel and no access remains for one of the severed parcels, the road improvement creates landlocked acreage. Landlocked acreage is treated like an uneconomic remnant by WisDOT (see previous discussion) if the parcel is less than 5 acres (2 ha). Compensation is offered for the damages caused by landlocking the acreage. Also, damages caused to the entire farm operation from loss of acreage are considered in the acquisition settlement.

In many cases, landlocked parcels are created when a parcel currently receives its sole access from US 8. In these instances, WisDOT would provide alternate access if feasible. As with farm severance, the number of farms having landlocked acreage correlates with the degree to which each alignment alternative follows the existing alignment. The number of landlocked parcels greater than 5 acres (2 ha) created by each alternative is presented in Table 4.1.1.8-1.



**D. Building Relocations**

All of the proposed alignments with the exception of the No-Build and Segment VI alternatives displace buildings. Building displacement can be compensated in two ways. If the building is not currently used, or is not essential to the farm operation the owner is typically compensated for the fair market value of the building. If the building is essential to the farm operation or serves as living quarters, it is considered a relocation. A suitable replacement is either found or built for this owner. A more detailed discussion of this process can be found in Section 4.2.1.1. The build alternatives displace between 3 and 35 farm buildings. Because of the proximity of current structures to the existing US 8 corridor, the on-alignment alternatives generally require a larger number of buildings to be displaced than the off-alignment alternatives.

**E. Access/Travel**

Highway improvements can alter access to farm properties by severing parcels or by relocating driveways. According to Section 85.05 of the Wisconsin Statutes, WisDOT must provide access to parcels separated by highway improvements in the majority of instances. On an access-controlled highway, WisDOT has the option to locate required access on town or county roads in order to ensure public safety (§85.25). When property held by one owner is severed, WisDOT can either provide cross-traffic access for travel between parcels or provide compensation for damages.

Limiting the number of access points to and from the highway may increase travel distances for farmers if they have fields on both sides of the highway or rent fields several miles from their home. The increased travel distance results in additional time, cost (fuel, machinery, etc.), and inconvenience to transport machinery and animals from the home farm and the separated fields.

The build alternative provides several benefits. One potential benefit to farm parcels is the improved access onto and across US 8. The current high traffic volume, small gaps, and poor stopping sight distance (SSD) on many portions of the corridor make it difficult to enter and cross the US 8 facility. This problem is particularly acute for slow moving farm vehicles. All alignments under consideration should substantially improve these conditions. With the No-build Alternative, however, these access difficulties would grow in magnitude to the point where entering and crossing maneuvers would be nearly impossible.

Another benefit includes easier travel along existing US 8 by farm machinery, as wider shoulders and additional lanes would help farm machinery avoid traffic flow. For alignment sections that bypass the existing roadway, traffic volume on the existing roadway should decrease, making farm travel easier.